



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

A NEW SPECIES OF CALOSTOMA.

BY GEO. F. ATKINSON.

During the autumn of 1902 I received several different species of fungi from Miss M. S. Percival, Rugby, Tenn. Among them were several interesting species of *Calostoma*. Among the first lot sent were four specimens of *Calostoma lutescens* (Schw.) Burnap, and several specimens of *Calostoma ravenelii* (Berk.) Masee. Miss Percival had correctly recognized *C. lutescens*, from the pale yellow inner surface of the exoperidium as it peels off. Although she made diligent search for *C. cinnabarinum** Desv., she found no specimens. Having never before seen *C. lutescens* and having never before examined the spores of *C. ravenelii*, although I had collected during September, 1901, in the mountains of North Carolina, what I took to be this species, I requested from Miss Percival additional material. The second lot received December 5th, contained one more specimen of *C. lutescens*, no specimens of *C. cinnabarinum*, but quite a number of specimens of *C. ravenelii*. Among these there seemed to be great variations in size, the foot stalk varying in length from 1 cm. up to 6 cm. and all the specimens showing numerous adherent warts over the middle and lower portion of the inner peridium. This seemed at the time, quite a remarkable feature of *C. ravenelii*, since all writers state that the foot stalk is short.

On examining the spores of some of the larger specimens, I observed that they were smooth as in *C. ravenelii*, but smaller. At the time I was not especially impressed by this fact, and yet I found that it was constantly recurring to my mind. On January 9th, 1903 I undertook a careful examination of the material and was surprised to find that the specimens with the short foot stalk had large and very variable spores, while those with the long foot stalk had small and little variable spores. At first I thought it would be impossible to separate the two kinds without an examination of the spores. But after some study, I found it quite easy in most cases to separate them by the gross characters alone, even those in which the foot stalk was intermediate, i. e. of the same length in the two species.

The plant with the longer foot stalk and smaller spores I will call *Calostoma microsporum*. The spores are usually oblong, smooth, more rarely elliptical and measure from 6.9×3.5 – 4.5 , rarely reaching 10μ long and 5μ wide. Burnap, Botanical Gazette, Vol. 23, page 190, 1897, gives no measurement for the spores of *Calostoma ravenelii*, but merely says, "spores elliptical, oblong, smooth." Masee, Ann. Bot. Vol. 2, page 48, 1888, gives the measurement and says: "spores elliptical to oblong, smooth,

*If the earlier specific name given by Persoon is retained this plant would be called *Calostoma callostoma* (Pers.)

colorless, $15-17 \times 8-9$." While the spores agree, therefore, in the two species in being smooth, and elliptical to oblong, or oblong to elliptical, there is a distinct difference in the size. The spores of *C. ravenelii*, in the specimens from Tennessee and also North Carolina, which I have examined, vary a great deal in size and also in shape, while those of *C. microsporum* do not show such great variations. A study of a single mount from one specimen of *C. ravenelii* from Tennessee gives the following measurements for individual spores; 6×7 , 6×17 , 10×15 , 10×21 , 12×16 , 16×16 , 15×18 , 19×21 . In a single mount of *C. ravenelii* from North Carolina the following measurements are taken: 6×7 , 8×10 , 12×22 , 5×20 . The larger number of the spores, however, in both cases are elliptical, and measure from $10-16 \times 5-7$. In some specimens nearly all are elliptical. The specimens of *C. ravenelii* from North Carolina which I have examined are those collected by myself on September 17th, 1901, along the roadside between Burnsville and Spruce Pine, at an altitude of about three thousand feet. They were growing in clay soil which contained a large amount of mica particles intermixed. They were the first specimens I had ever seen, although I had collected on the higher elevation at Blowing Rock, large numbers of *Calostoma cinnabarinum* during several seasons. At the time I collected the specimens of *C. ravenelii* it was raining hard. While returning from the Black mountains, a small patch of these plants growing by the roadside at once attracted my attention, and so different were they in size and in general appearance from *C. cinnabarinum* I felt they must be *C. ravenelii*. The spores were not studied until the autumn of 1902. These plants vary from 1-4 cm. high, the foot stalk from .5-3 cm. high. The dehiscence of the exoperidium is somewhat variable, in some specimens quite large patches separate from the inner peridium only remaining slightly attached, especially toward the apex, the patches of the exoperidium often become entirely free, leaving a smooth area around the mouth. The middle and lower half of the inner peridium in these cases is then covered with a few large scaly warts, or in a few cases with a large number of smaller ones. In some specimens the entire endoperidium is covered, except here and there are exposed places where the outer peridium has cracked and become partially free. In the specimens from Tennessee of *C. ravenelii*, the plants vary from 2-4 cm. high, the foot stalk from 1-3 cm. long. Nearly all of the specimens show a smooth area over the upper part of the inner peridium around the mouth, while on the lower and middle part there is in almost all cases a large number of smaller warts.

In *C. microsporum*, the gross characters of the plants resemble very much those of *C. ravenelii*, except as stated above. On the average the foot stalk is longer, ranging from 3 cm. to 6 cm. and the peridium is somewhat larger. The smaller specimens of *C. microsporum*, however, are very near in size to the

larger specimens of *C. ravenelii*. In fact, it might be said, as far as the size is concerned, in these forms which might be termed intermediate, there is no difference. Yet, with the number of the plants mixed as they were in the collection, after having studied a few of each kind, I was able to separate the remainder into two lots and all of those I examined thus separated by the eye, agreed in microscopic characters with those which had formerly been examined representing each species. The specimens of the same size in the two species do show, even in the dry specimens, some slight differences, which can be seen better than described. In the first place the inner peridium of *C. ravenelii* is lighter in color than that of *C. microsporum*, although in some cases there is scarcely any difference. In the second place, the mouth of *C. ravenelii* is not quite so prominent as that in *C. microsporum*. In the latter, the teeth are larger, longer, and as far as I have examined, are only vermilion colored on their inner faces. In *C. ravenelii*, however, in many specimens, the outer face of the teeth is vermilion as well as the inner face. In some specimens, however, this is not the case, only the inner face is vermilion in color, but then as above stated, the teeth are usually not so prominent. This comparison has been made only with the specimens of the two species from Tennessee. All of the specimens which I have collected in North Carolina were much lighter in color. All of these show the less prominent teeth, and in many specimens the teeth are vermilion color without and within.

The specimens of *C. ravenelii* from Tennessee resemble very much *Calostoma lurida* (Berk.) Massee from Australia, (Ann. Bot. Vol. 2, p. 43-44, figs. 19-20, 1888.) The resemblance is shown in the size of the plant and general size of the spores, and in the fact that the exoperidium breaks up into small blackish granules over the middle and lower portion. In *C. lurida*, however, there is no vermilion color. The inner faces of the teeth as well as the edges being black.

This new species should be looked for and carefully studied in the field in the fresh condition. It is quite likely that still additional characters might be observed. The following preliminary diagnosis will serve to characterize the species:

CALOSTOMA MICROSPORUM Atkinson n. sp. Plants 4-7 cm. high, foot stalk 3-6 cm. by 1-2 cm., cylindrical or ventricose or enlarged below, sometimes compressed, rarely two foot stalks joined throughout the entire length. Peridium oval, 10-15 mm. broad; teeth 5-7, prominent, vermilion colored on their inner faces; exoperidium separating into numerous small hard adherent warts, covering the middle and lower surface of the endoperidium, usually entirely separating from the upper surface leaving a smooth area on the inner peridium around the mouth. Spores white, smooth, oblong, some rarely elliptical, 6-10 x 3.5-5 μ . Pro-

toplasm usually homogeneous, sometimes granular, often showing a tendency to be constricted at the middle, perhaps because of a clear area at this point. Rugby, Tennessee. Collected by M. S. Percival, 1902.

Botanical Department, Cornell University.

January 9, 1903.

OHIO FUNGI. FASCICLE VI.

W. A. KELLERMAN, OHIO STATE UNIVERSITY.

The following species are included, occurring on the hosts named:—

101. *Coniosporium arundinis* (Corda), Sacc., on *Phragmites phragmites* (L.) Karst.
102. *Melasmia hypophylla* (B. et Rav.) Sacc., on *Gleditsia triacanthos* L.
103. *Mollisia dehnii* (Rabenh.) Karst., on *Potentilla monspeliensis* L.
104. *Peridermium pini* Wallr., on *Pinus rigida* Mill.
105. *Polyporus resinosus* (Schr.) Fr., on rotten wood.
106. *Puccinia fusca* (Pers.) Winter, on *Anemone quinquefolia* L.
107. *Puccinia helianthi* Schw., on *Helianthus ambiguus* (T. & G) Britt.
108. *Puccinia muhlenbergiae* Arth. & Holw., on *Muhlenbergia mexicana* (L.) Trin.
109. *Puccinia muhlenbergiae* Arth. & Holw., on *Muhlenbergia diffusa* Willd.
110. *Puccinia myrrhis* Schw., on *Washingtonia claytoni* (Mx.) Britt.
111. *Puccinia myrrhis* Schw., on *Chaerophyllum procumbens* (L.) Crantz.
112. *Puccinia myrrhis* Schw., on *Chaerophyllum procumbens* (L.) Crantz.
113. *Puccinia myrrhis* Schw., on *Washingtonia claytoni* (Mx.) Britt.
114. *Puccinia myrrhis* Schw., on *Washingtonia longistylis* (Torr.) Britt.
115. *Puccinia polygoni-amphibii* Pers., on *Polygonum emersum* (Mx.) Britt.
116. *Pucciniastrum agrimoniae* (DC.) Diet., on *Agrimonia parviflora* Soland.
117. *Septoria œnothææ* (Lasch) West., on *Onagra biennis* (L.) Scop.
118. *Septoria verbascicola* B. & C., on *Verbascum blattaria* L.
119. *Uromyces burrillii* Lagerh., on *Scirpus fluviatilis* (Torr.) Gr.
120. *Uromyces toxicodendri* Berk. & Rav., on *Rhus radicans* L.

Thanks are extended to the numerous mycologists who in various ways have kindly assisted in preparing the data for labels and determining material. Credit on each label is given the collector.

Corrections (or new labels) are included for Nos. 1, 3, 18, 64, and 88, previously issued.

The date of issue of Fascicle VI, Nos. 100-120, is Feb. 14, 1903.